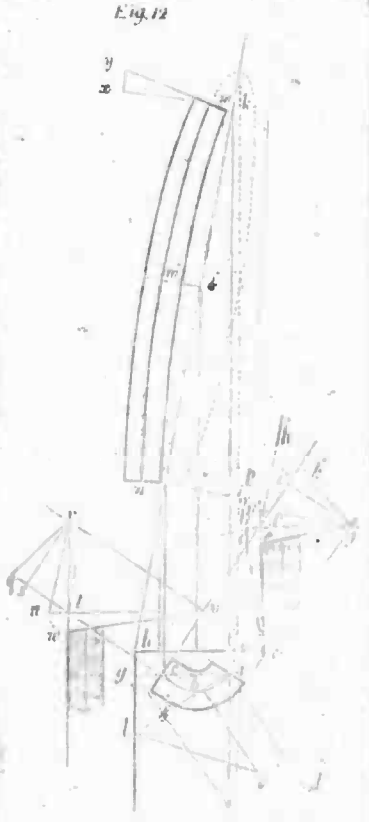
winding the development of the line of heights round the surface of the cylinder; and that, which is produced on the same surface by the inter-section of the cutting plane, made to pass through any three given points which approximate nearest to the line of heights. From this it will be seen that the central line *m n* of the face-mould approximates very nearly to the centre line of the hand-rail; and as our line of heights is made to pass through the centre of the rail, it therefore follows, that if we mark off a parallel width of 1½ inches (one-half the width of the rail), on each side of the central line *m n*, we shall have a face-mould, which, when marked on both surfaces of the plank, each face being brought directly opposite the other, the solid may cut out of the plank, of substance sufficient for the formation of our rail when moulded to its finished shape.

Fig. 12



31. But we are first to determine not only the width for a face-mould of this description, but also to lay down such lines as may enable us to work the butt-joints with accuracy. Having already determined the points *m* and *n*, in the central elliptic curve of the face-mould, let us proceed to find the bevels, not only for the ends of the face-mould, but also the bevels of the ends across the thickness of the plank. Thus to find the bevel for the end of the wreathed portion of the rail, contiguous to the straight part of the rail, over the upper range of flyers—in fig. 10, take any point *h e* in the line *f c* draw *h g* perpendicular to *f c*, cutting the line of the butt-joint *f g* in the point *g*: in fig. 11, draw a line from O in the centre of the circle on the plan of the rail through the point *b*; also draw the line *e g* parallel thereto; draw any line *e n* parallel to the intersecting line *h i*; make the perpendicular distance of the point *d* from the line *e g*, equal to *h g* in fig. 10. Through the point *d* draw the line *b g* at right angles to *a c*; make *d c* equal to *h f* in fig. 10; join *a g*, and draw the line *d h* parallel to *h k*, intersecting the line *a g*, as shewn in the figure in the point *i*. From this point of intersection, and with one point of the compasses in the point *d*, describe the dotted circular line, cutting the line *h g* in the point *b*; join *b e* from which let fall the perpendicular line *e d*; and with *d* as a centre, describe the circular line *e f*, cutting *d c* in the point *f*; join *f g*, and the angle *e f g* is the bevel which is to be applied to the end of the face-mould in forming the butt-joint across the thickness of the plank.

32. Again, to find the bevel or end of the face-mould for our guidance in marking the face of the plank: having already drawn the ordinate line, *o n*, at right angles to *h k*, make the distance *o n* equal to *d e*, also make the perpendicular line, *o p*, equal to *b d*, and through the points, *n p*, draw the line across the end of the face-mould, as shewn in the engraving, which is the end of the face-mould required. The bevels for the opposite end of this face-mould, are obtained in a similar manner. Let the line of the butt-joint, through the point *d* of the development, fig. 10, form the hypothenuse to a right-angled triangle, whose base, *k l*, is parallel to the line A B. In fig. 11 draw a line through the centre O of the circle and the point *a* of the plan of the rail; let this line be produced to the distance of the points *t* and *q*, as shewn in the engraving. At any distance from the point *q*, draw the line, *r v*, parallel to *q t*; make the triangle, *q r s*, in fig. 11, similar, in all respects, to the triangle, *k l i*, in fig. 10; parallel to *q i* draw the line *r t*, cutting the line *q t* in *t*; from the point *t*, draw the line *t u* at right-angles to the line *r t*, and cutting the line *r v* in the point *v*. Then, with the line *r t* as a base, form a right-angled triangle, whose perpendicular, *t u*, make equal to *q s*. With the point *t* as a centre describe a circle touching the nearest point of the hypothenuse, *r u*, and cutting the line *r t*, produced in the point *w*, join *w v*, and the angle which it forms with *t w* will be the bevel to be applied across the thickness of the plank.

33. The direction of the end of the face-mould through the point *m* may be ascertained in the following manner:—Produce the ordinate line through the point *m* to *x*, make the distance, *m x*, the same as *r t*; from the point *x* let fall the perpendicular line *x y*, which make equal to *t u*; next draw the line *y m*, which, when produced across the width of the face-mould, will form the position of the end thereof.

34. The bevels for the other portion of the wreathed rail may be obtained in a similar manner to those here shewn.

35. The more important use of these bevels are for the purpose of constructing the jointing-box (which we shall hereafter describe), without which it will be next to impracticable, by the use of the plane and the bevels only, to work to that degree of truth which the nature of the work requires. The shaded parts in the figures shew the thickness of the plank, on which a centre line is drawn, also shewing by the end thereof what allowance should be made beyond the centre of the butt-joint for the obliquity of the planes of the butt-joints with the planes of the faces of the plank.

PROPOSED NEW PARK AT BATTERSEA.

Public attention has recently been directed to the formation of a new park in Battersea-fields. It has been ascertained that 500 or 600 acres of land might be purchased there at very moderate price; and if half of it only were appropriated to the public as a park, the other half would, if let for building, most likely produce sufficient rental to pay all expenses; and it would make a valuable place of recreation to the public, who could get easy access to it from the most crowded parts of London. The steam-boats have become a very important means of transit; they still appear to be increasing very much, and probably they cannot have too much encouragement. By diverting the busy traffic of our streets to the river, they relieve the crowded thoroughfares of the town, and they have already proved themselves to be important auxiliaries in the cleansing of the river and its shores.

By means of these boats this park would be accessible to a vast number of all classes of persons who live on both sides of the Thames, including the whole extent of London, a length of 7 or 8 miles. The poorer class of persons could get there by the steam-boats at a less expense than they can get a change of air in any other way.

Another of the advantages connected with the purchase of this land at Battersea, would be that from its position by the side of the Thames, there would be facilities for making large pieces of water. In summer these might be changed, if necessary, every tide; and they would furnish an excellent bathing-place for the working population in hot weather. At present the working classes have no means (or at best very limited means) of bathing. These baths might be so inclosed by plantations as to prevent them from being in any way offensive, and on that account would be much fitter for the purpose than the Serpentine River, where the bathing is always a great nuisance, and so offensive, as to drive many persons from the park, and where, even if this objection did not exist, there is not a tenth part of the space requisite for these purposes. Besides, any bathing-places made here would not only have the advantage of the water being frequently changed, but they might be so regulated as to be perfectly free from danger, by standing at any desired depth, being affected neither by dry weather nor by floods.

A further advantage, it is obvious, which would result to the population of London of all classes (and one which would be attended by not one shilling additional expense), would be the very perfect skating-ground which these pieces of water would afford in winter. Now the ground is of comparatively little value at present, and therefore very extensive means of promoting the health and recreation of the public could be acquired for a small sum. The number of persons who would take advantage of it would be immense, and however desirable it may be (and it undoubtedly is so) to widen our crowded thoroughfares, and to improve our over-populated districts, yet some outlay would not be misapplied in the acquisition and inclosure of spaces on the immediate outskirts of the town where there is little if any building at present to remove; and where, consequently, improvements could be made at comparatively small expense, to make good communications and airing places to which the public would be tempted to resort, and above all, in the selection, when opportunities offer, of sites having the river for their leading highway—a highway subject neither to the wear and tear, nor the expensive repairs, nor the dusty and inconvenient transit in dry weather of ordinary roads, and by which it is obvious no one can travel without, by that alone, whatever may be his occupation, enlarging his stock of health.

Mr. Thomas Cubitt, the eminent builder, has the credit of having first proposed this improvement. The daily observation and extensive intercourse which this gentleman has with artisans and working people of all sorts, his means of knowing their reasonable wants and their real value, and the unusual interest he takes in whatever concerns the health and comfort of the poorer classes of our population, evidently led to the idea, and induced him to submit his philanthropic proposal to the consideration of her Majesty's Commissioners for the Improvement of the Metropolis, who, in their second report (the first being exclusively devoted to the embankment of the Thames), will doubtless refer to it at length.

Engineering in Egypt.—On the 26th of November, a dry dock at Alexandria, which has been about eight years in execution, and has cost Mehemet Ali half a million sterling, was opened, and the first vessel hauled in. According to the *Times*, it is constructed in deep water; and the engineer, a Frenchman, of the name of Mougel, had great difficulties to contend with from the nature of the soil, besides labouring under a peculiar disadvantage, owing to there being no tides in this port. The dock has been made on the model of that of Toulon; its length is 243 feet, and its width 72 feet, taken on a level with the sea. M. Mougel will shortly leave for France, and it is said that he has received from Mehemet Ali instructions to take all the necessary measures for the construction of the "barrage" of the Nile, which work, if ever completed, will be a great boon to Egypt. The site fixed upon, at present, for this purpose is the point of ramification of the Rosetta and Damietta branches of the river, about ten miles below Cairo. It will consist of two bridges, one over each branch of the Nile, both joining at the extreme point of the Delta. The bridges will be formed of a certain number of arches, and one arch of each bridge will be made with a lock, for the purpose of navigation. In the centre of the Delta, will be opened several canals, to which the water of the Nile will be allowed ingress, as it may be required.